Resource Management Agency
Building Division

2007
CALIFORNIA BUILDING CODE
&
2008 BUILDING ENERGY EFFICIENCY STANDARDS

MECHANICAL PERMIT APPLICATION

PERMIT APPLICATION AND INSPECTION INSTRUCTIONS

1. Complete the site address and owner information on the reverse side of this sheet.
2. Provide the manufacturer information for the proposed windows
3. Provide the capacity information on the proposed equipment.
4. Sign and date the application.
5. Complete and include the attached CF-1R ALT form with this application.

INSPECTIONS

New gas lines shall be pressure tested and inspected before being connected to gas supply or equipment.

After the new equipment has been installed, an inspection is required to confirm proper installation and energy efficiency standards have been met.

All flashings shall be complete and the building envelop is to be properly sealed.

The completed and signed CF-6R-MECH-04 documents; and any required HERS test documents shall be on site at the time of inspection.

MECHANICAL PERMIT APPLICATION

Effective January 1 2010

SITE ADDRESS: _____

APN: _____ — _____ — _____

OWNER: _____

ADDRESS: _____

_____

PHONE NUMBER: _____

PROJECT VALUE: $ _____

HVAC MANUFACTURER: _____

HVAC MODEL NUMBER: _____

FURNACE/HEATER MODEL: _____

BTU OUTPUT : _____ BTU INPUT: _____ AFUE: _____

CONDENSING UNIT MODEL : _____

BTU COOLING CAPACITY: _____ SEER: _____ EER: _____

***** NOTE: Duct sealing and HERS test may be required with the installation of new equipment. *****

See the CF-1R documents.

New duct work to be installed? ☐ Yes ☐ No Length of duct in feet? _____

New gas line? ☐ Yes ☐ No Size: _____ Number of connections: _____

New electric circuit? ☐ Yes ☐ No Number of circuits: _____ Voltage: _____ Amps: _____

Mechanical Vents? ☐ Yes ☐ No Number of vents: _____ Vent size: _____

Other Project Information: _____

_____

_____

_____

INSTALLER NAME: _____

INSTALLER ADDRESS: _____

PHONE NUMBER: _____

LICENSE NUMBER: _____

_____ _____

SIGNATURE DATE

Instructions and Inspection Schedule on reverse side of this document.

2008 Building Energy Efficiency Standards
Residential HVAC Alterations
Climate Zones 10 to 15

BUSINESS AND PROFESSIONS CODE, SECTION 7110
Willful or deliberate disregard and violation of the building laws, including the California Building Code, and local permit requirements constitutes a cause for disciplinary action from the Contractors State License Board working in conjunction with the local building department. This action may consist of fines up to $5,000 per violation or suspension/revocation of a contractor's license.

WHEN IS A PERMIT REQUIRED?
A written construction permit shall be obtained from the enforcement agency prior to the erection, construction, reconstruction, installation, relocation, or alteration of any mechanical system, except as permitted in Appendix Chapter 1, Section 112.2 of the 2007 California Mechanical Code. Projects requiring permits include, but are not limited to:

- New HVAC installation
- HVAC Change-out
- Replacement of furnace, coil, FAU, or condenser
- Relocation of an existing HVAC unit
- Adding or replacing more than 40ft ducting in unconditioned space

2008 BUILDING ENERGY EFFICIENCY STANDARDS (Title 24, Part 6) REQUIREMENTS INCLUDE:
1. Heating equipment must have a minimum 78% AFUE (Exception: Wall & floor furnaces; room heaters).
2. Central air conditioners & heat pumps less than 65,000 Btu/hr must have a minimum 13 SEER.
3. Newly installed or replaced ducts must have a minimum insulation value of R-4.2. When more than 40 ft of ducting will be installed or replaced, the duct insulation value must be R-6 (CZ 10-13), or R-8 (CZ 14 and 15).
4. A setback type thermostat (24 hr clock with four set points) is required for all alterations.
5. New or replacement ducts must meet the mandatory requirements of Section 150(m):
   - All joints and openings in the in the HVAC system must be sealed.
   - Only UL 181, UL 181A, or UL 181B approved tapes or mastic shall be used to seal duct openings.
   - Connections of metals ducts and the inner core of flex ducts shall be mechanically fastened. Flex ducts must be connected using a metal sleeve/coupling.
   - Flex ducts that are suspended must be supported every 4ft. max for horizontal runs with no more than 2" of sag between supports and 6 ft. max for vertical runs.

WHEN IS HERS VERIFICATION REQUIRED AND WHAT FORMS ARE REQUIRED?
HERS verification is required for **all** HVAC alterations in Climate Zone 10-15. A HERS rater is a special inspector for the building department. The building inspector may also request to be on site to witness testing by the contractor and/or HERS rater. The installer picks one of the four options on the CF-1R-ALT-HVAC Form that describe the work being conducted. Each option lists the forms required to be at the job site for final inspection.

- CF-6R Forms shall be completed and submitted by the installing contractor for final inspection.*
- CF-4R Forms shall be completed, registered with an approved HERS Provider (cannot be completed by hand), and submitted by the HERS Rater for final inspection effective January 1, 2010.

DESCRIPTION OF HERS TESTS BELOW
(Full descriptions found in Residential Appendix RA3 and Residential Manual)
Duct sealing – The installer is to insure leakage of the HVAC system is less than 6% for new air conditioning system(new equipment) and all new ducts) or 15%, 60% reduction, seal all accessible leaks, etc. for alterations to existing HVAC systems. When the contractor uses the option to seal all accessible leaks, all easily movable objects must be moved to seal existing ducting. New ducting installed by the contractor is not allowed to have any leaks even if it is no longer accessible. In example 3 of the CF-1R "all new ducts" means that all the ducting was changed. The original boots, plenums, etc. do not need to be changed.
Cooling Coil Airflow (CCA) – There are two different minimum air flow requirements that must be met. These are 300 CFM and 350 CFM. The minimum 300 CFM per ton of cooling is required in order to conduct a refrigerant charge test. For new HVAC systems (new equipment and new ducts) the HVAC system must move a minimum 350 CFM of air for each ton of cooling.
Refrigerant Charge (RC) – The installer is required to verify the charge is correct. If the outside temperature is below 55 degrees then the weigh in method must be used by the installer. When the weigh in method is used the HERS rater must retest when the temperature is 55 and above. A charge indicator display (CID) can be used in place of conducting an RC, manufacturers are currently developing this device.
Temperature Measurement Access Holes (TMAH) – Installer must drill and mark holes to measure temperature split.
Hole for the placement of a Static Pressure Probe (HSPP) or Permanently installed Static Pressure Probe (PSPP) – Either the installer must drill and mark holes to measure static pressure or a permanently installed pressure probe must be installed and marked.
Saturation Temperature Measurement Sensors (STMS) – Permanently installed type K thermocouple are installed on the indoor and outdoor coil so that the HERS rater can verify charge without attaching gauges. Instructions are found in Ch 4 of the Res. Manual.
Fan Watt Draw (FWD) – Installer verifies that the furnace fan watt draw is less than 0.58 Watts/CFM.

NOTE: The CF-6R-MECH-04 is required for all HVAC alterations.
*** For Final inspection ALL compliance forms (CF-1Rs, CF-6Rs, and CF-4Rs) shall be registered with an approved HERS Provider for building permit applications submitted on or after October 1, 2010.**

Simplified Prescriptive Certificate of Compliance: 2008 *Residential HVAC Alterations* **CF-1R-ALT-HVAC**

Climate Zones 10 to 15

Site Address:	*Enforcement Agency:*	*Date:*	*Permit #:*

Equipment Type[1]	List Minimum Efficiency[2]		Duct insulation requirement	Conditioned Floor Area	Thermostat
☐ Packaged Unit ☐ Furnace ☐ Indoor Coil ☐ Condensing Unit ☐ Other	☐ AFUE____ ☐SEER_____ ☐ EER _____	☐ COP_____ ☐ HSPF ____ ☐ Resistance	Over 40 ft of ducts added or replaced in unconditioned space ☐ R 6 *(CZ 10-13)* ☐ R 8 *(CZ 14-15)*	Served by system _____ sf	☐ Setback *(If not already present, must be installed)*

*1. **Equipment Type**: Choose the equipment being installed; if more than one system, use another CF-1R-ALT-HVAC for each system.*

*2. **Minimum Equipment Efficiencies**: 13 SEER, 78% AFUE, 7.7HSPF for typical residential systems.*

HERS VERIFICATION SUMMARY Listed below are four HVAC alteration Options. The installer decides what work is being done and picks **one** of the appropriate Options. Each Option lists the HERS measures that must be conducted. A copy of the forms shall be left on site for final inspection and a copy given to the homeowner. At final, the inspector verifies that the work listed on this form was in fact the work completed by the installer. The inspector also verifies that each appropriate CF-6R and registered CF-4R forms (no hand filled CF-4Rs allowed) are filled out and signed. **Beginning October 1, 2010, a registered copy of the CF-1R and CF-6R shall also be on site for final inspection.**

☐ **1. HVAC Changeout**	**Required Forms:**
• All HVAC Equipment replaced	CF-6R forms: MECH-04, MECH-21-HERS and (for split systems) MECH- 25-HERS CF-4R forms: MECH- 21 and (for split systems) MECH-25
• Condenser Coil and /or • Indoor Coil and /or • Furnace	CF-6R forms: MECH-21-HERS and (for split systems) MECH- 25-HERS CF-4R forms: MECH- 21 and (for split systems) MECH-25

For Split Systems: Duct leakage < 15 percent; RC, CCA ≥ 300 CFM/ton(Minimum Air Flow Requirement), TMAH
For Packaged Units: Duct leakage < 15 percent
Exempted from duct leakage testing if:
- ☐ 1. Duct system was documented to have been previously sealed and confirmed through HERS verification, or
- ☐ 2. Duct systems with less than 40 linear feet in unconditioned space, or
- ☐ 3. Existing duct systems are constructed, insulated or sealed with asbestos

☐ **2. New HVAC System**	**Required Forms:**
• Cut in or Changeout with new ducts: (all new ducting and all new equipment)	CF-6R forms: MECH-04, MECH-20-HERS,and (for split systems) MECH-22-HERS, and MECH-25-HERS CF-4R forms: MECH 20-, and (for split systems)MECH-22, and MECH 25

For Split Systems: Duct leakage < 6 percent; RC, CCA ≥ 350 CFM/ton, FWD, TMAH, STMS, and either HSPP or PSPP.
For Packaged Units: Duct leakage < 6 percent

☐ **3. New Ducts with Replacement**	**Required Forms:**
• Includes replacing or installing **all** new ducting and/or outdoor condensing unit and/or indoor coil and/or furnace. Not all equipment changed.	CF-6R forms: MECH-04, MECH-20-HERS,and (for split systems) MECH-25-HERS CF-4R forms: MECH-20 and (for split systems) MECH-25

For Split Systems: Duct leakage < 6 percent, RC, CCA ≥ 300 CFM/ton, TMAH
For Packaged Units: Duct leakage < 6 percent

☐ **4. New Ducting over 40 feet**	**Required Forms:**
• Includes adding or replacing more than 40 linear feet of duct in unconditioned space.	CF-6R forms: MECH-04, MECH-21-HERS CF-4R forms: MECH-21

For split system or packaged units: Duct leakage < 15 percent
- ☐ EXCEPTION: Existing duct systems constructed, insulated or sealed with asbestos.

Contractor (Documentation Author's /Responsible Designer's Declaration Statement)

- I certify that this Certificate of Compliance documentation is accurate and complete.
- I am eligible under Division 3 of the California Business and Professions Code to accept responsibility for the design identified on this Certificate of Compliance.
- I certify that the energy features and performance specifications for the design identified on this Certificate of Compliance conform to the requirements of Title 24, Parts 1 and 6 of the California Code of Regulations.
- The design features identified on this Certificate of Compliance are consistent with the information documented on other applicable compliance forms, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with the permit application.

Name:	Signature:	
Company:		Date:
Address:		License:
City/State/Zip:		Phone:

2008 Building Energy Efficiency Standards
Residential HVAC Alterations
Climate Zone 16

BUSINESS AND PROFESSIONS CODE, SECTION 7110
Willful or deliberate disregard and violation of the building laws, including the California Building Code, and local permit requirements constitutes a cause for disciplinary action from the Contractors State License Board working in conjunction with the local building department. This action may consist of fines up to $5,000 per violation or suspension/revocation of a contractor's license.

WHEN IS A PERMIT REQUIRED?
A written construction permit shall be obtained from the enforcement agency prior to the erection, construction, reconstruction, installation, relocation, or alteration of any mechanical system, except as permitted in Appendix Chapter 1, Section 112.2 of the 2007 California Mechanical Code. Projects requiring permits include, but are not limited to:

- New HVAC installation
- HVAC Changeout
- Replacement of furnace, coil, FAU, or condenser
- Relocation of an existing HVAC unit
- Adding or replacing more than 40ft ducting in unconditioned space

2008 BUILDING ENERGY EFFICIENCY STANDARDS (Title 24, Part 6) REQUIREMENTS INCLUDE:
1. Heating equipment must have a minimum 78% AFUE (Exception: Wall & floor furnaces; room heaters).
2. Central air conditioners & heat pumps less than 65,000 Btu/hr must have a minimum 13 SEER.
3. Newly installed or replaced ducts must have a minimum insulation value of R-4.2.
4. A setback type thermostat (24 hr clock with four set points) is required for all alterations.
5. New or replacement ducts must meet the mandatory requirements of Section 150(m):
   - All joints and openings in the HVAC system must be sealed.
   - Only UL 181, UL 181A, or UL 181B approved tapes or mastic shall be used to seal duct openings.
   - Connections of metals ducts and the inner core of flex ducts shall be mechanically fastened. Flex ducts must be connected using a metal sleeve/coupling.
   - Flex ducts that are suspended must be supported every 4 ft. max for horizontal runs with no more than 2" of sag between supports and 6 ft. max for vertical runs.

WHEN IS HERS VERIFICATION REQUIRED AND WHAT FORMS ARE REQUIRED?
A HERS rater is a special inspector for the building department. The building inspector may also request to be on site to witness testing by the contractor and/or HERS rater. The installer picks one of the four options on the CF-1R-ALT-HVAC Form that describe the work being conducted. Each option lists the forms required to be at the job site for final inspection.

- CF-6R Forms shall be completed and submitted by the installing contractor for final inspection.*
- CF-4R Forms shall be completed, registered with an approved HERS Provider (cannot be completed by hand), and submitted by the HERS Rater for final inspection effective January 1, 2010.

DESCRIPTION OF HERS TESTS BELOW
(Full descriptions found in Residential Appendix RA3 and Residential Manual)
Duct sealing – The installer is to insure leakage of the HVAC system is less than 6% for new air conditioning system (new equipment and all new ducts) or 15%, 60% reduction, etc. for alterations to existing HVAC systems. When the contractor uses the option to seal all accessible leaks, all easily movable objects must be moved to seal existing ducting. New ducting installed by the contractor is not allowed to have any leaks even if it is no longer accessible. In example 3 of the CF-1R "all new ducts" means that all the ducting was changed. The original boots, plenums, etc. do not need to be changed.
Cooling Coil Airflow (CCA) – When a refrigerant charge test is required, the system must first be tested to move a minimum 300 CFM per ton of cooling. An accurate charge cannot be conducted with air flows lower than 300 CFM per ton of cooling. Air flows can usually be increased by adding a larger return duct and grill or a second return duct and grill.
Temperature Measurement Access Holes (TMAH) – Installer must drill and mark holes to measure temperature split.

NOTE: The CF-6R-MECH-04 is required for all HVAC alterations.
*** For final inspection ALL compliance forms (CF-1Rs, CF-6Rs, and CF-4Rs) shall be registered with an approved**

HERS Provider for building permit applications submitted on or after October 1, 2010.

Simplified Prescriptive Certificate of Compliance: 2008 *Residential HVAC* CF-1R-ALT-HVAC

Climate Zone 16

Site Address:	*Enforcement Agency:*	*Date:*	*Permit #:*

Equipment Type[1]	List Minimum Efficiency[2]		Conditioned Floor Area	Duct insulation requirement	Thermostat
☐ Packaged Unit ☐ Furnace ☐ Indoor Coil ☐ Condensing Unit ☐ Other _____	☐ AFUE____ ☐SEER_____ ☐ EER _____	☐ COP_____ ☐ HSPF ____ ☐ Resistance	Served by system _____ sf	Over 40 ft of ducts added or replaced in unconditioned space ☐ R 8 (CZ 16)	☐ Setback *(If not already present, must be installed)*

1. **Equipment Type**: Choose the equipment being installed; if more than one system, use another CF-1R-ALT-HVAC for each system.
2. **Minimum Equipment Efficiencies**: 13 SEER, 78% AFUE, 7.7HSPF for typical residential systems.

HERS VERIFICATION SUMMARY Listed below are four HVAC alteration Options. The installer decides what work is being done and picks **one** of the appropriate Options. Each Option lists the HERS measures that must be conducted. A copy of the forms shall be left on site for final inspection and a copy given to the homeowner. At final, the inspector verifies that the work listed on this form was in fact the work completed by the installer. The inspector also verifies that each appropriate CF-6R and registered CF-4R forms (no hand filled CF-4Rs allowed) are filled out and signed. **Beginning October 1, 2010, a registered copy of the CF-1R and CF-6R shall also be on site for final inspection.**

☐ **1. HVAC Changeout**	**Required Forms**:
• All HVAC Equipment replaced	CF-6R forms: MECH-04 and MECH-21-HERS CF-4R forms: MECH- 21
• Condenser Coil and /or • Indoor Coil and /or • Furnace	CF-6R forms: MECH-21-HERS CF-4R forms: MECH- 21

For Split Systems: Duct leakage < 15 percent
For Packaged Units: Duct leakage < 15 percent
Exempted from duct leakage testing if:
- ☐ 1. Duct system was documented to have been previously sealed and confirmed through HERS verification, or
- ☐ 2. Duct systems with less than 40 linear feet in unconditioned space, or
- ☐ 3. Existing duct systems are constructed, insulated or sealed with asbestos

☐ 2. **New HVAC System**	**Required Forms**:
• Cut in or Changeout with new ducts: (all new ducting and all new equipment)	CF-6R forms: MECH-04 and MECH-21-HERS CF-4R forms: MECH- 21

For Split Systems: Duct leakage < 6 percent,
For Packaged Units: Duct leakage < 6 percent

☐ 3. **New Ducts with Replacement**	**Required Forms**:
• Includes replacing or installing **all** new ducting and/or outdoor condensing unit and/or indoor coil and/or furnace. Not all equipment changed.	CF-6R forms: MECH-04 and MECH-20-HERS CF-4R forms: MECH-20

For Split Systems: Duct leakage < 6 percent
For Packaged Units: Duct leakage < 6 percent

☐ 4. **New Ducting over 40 feet**	**Required Forms**:
• Includes adding or replacing more than 40 linear feet of duct in unconditioned space.	CF-6R forms: MECH-04 and MECH-21-HERS CF-4R forms: MECH-21

For split system or packaged units: Duct leakage < 15 percent
- ☐ EXCEPTION: Existing duct systems constructed, insulated or sealed with asbestos.

Contractor (Documentation Author's /Responsible Designer's Declaration Statement)
- I certify that this Certificate of Compliance documentation is accurate and complete.
- I am eligible under Division 3 of the California Business and Professions Code to accept responsibility for the design identified on this Certificate of Compliance.
- I certify that the energy features and performance specifications for the design identified on this Certificate of Compliance conform to the requirements of Title 24, Parts 1 and 6 of the California Code of Regulations.
- The design features identified on this Certificate of Compliance are consistent with the information documented on other applicable compliance forms, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with the permit application.

Name:	Signature:	
Company:		Date:
Address:		License:
City/State/Zip:		Phone:

Mandatory Measures Summary — MF-1R

Residential —

Site Address:	Enforcement Agency:	Date:

NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

DESCRIPTION

Building Envelope Measures:

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

Fireplaces, Decorative Gas Appliances and Gas Log Measures:

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

Space Conditioning, Water Heating and Plumbing System Measures:

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.

§150(j)2: Cooling system piping (suction, chilled water, or brine lines),and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.

Ducts and Fans Measures:

§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used

§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

Pool and Spa Heating Systems and Equipment Measures:

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

Residential Lighting Measures:

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy.

EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft^2 or 100 watts for dwelling units larger than 2,500 ft^2 may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupant sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luimnaires.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119.

EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the lumiunaire is airtight with air leakage less then 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy.

EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on

EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours.

EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires.

EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

INSTALLATION CERTIFICATE		CF-6R-MECH-04
Space Conditioning Systems, Ducts and Fans		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

Space Conditioning Systems

Heating Equipment

Equip Type (package-heat pump)	CEC Certified Mfr. Name and Model Number	ARI Reference Number [2]	# of Identical Systems	Efficiency (AFUE, etc.)[1,3] (≥CF-1R value)[4]	Duct Location (attic, crawl-space, etc.)	Duct R-value	Heating Load (Btu/hr)	Heating Capacity (Btu/hr)

Cooling Equipment

Equip Type (package heat pump)	CEC Certified Mfr. Name and Model Number	ARI Reference Number [2]	# of Identical Systems	Efficiency (SEER and EER) [1,3] (≥CF-1R value) [4]	Duct Location (attic, crawl-space, etc.)	Duct R-value	Cooling Load (Btu/hr)	Cooling Capacity (Btu/hr)

1. If project is new construction, see Footnotes to Standards Table 151-B and Table 151-C for duct ceiling alternative compliance.

2. ARI Reference Number can be found by entering the equipment model number at http://www.aridirectory.org/ari/ac.php#

3. Listed efficiency on this page must be greater than or equal (≥) to the value shown on the CF-1R form.

4. When CF-1R is reference it is also applicable to the CF-1R, CF-1R-AA or CF-1R-ALT

ALL BOXES MUST BE CHECKED TO BE A VALID FORM

☐ §110-§113: HVAC equipment is certified by the California Energy Commission.

☐ §150(h): Heating and/or cooling loads calculated in accordance with ASHRAE, SMACNA, or ACCA.

☐ §150(i): Setback Thermostat on all applicable heating and/or cooling systems meet the requirements of §112(c).

☐ §150(j)2: Pipe insulation for cooling system refrigerant suction, chilled water and brine lines meets minimum requirements of Table 150-B and includes a vapor retardant or is enclosed entirely in conditioned space.

Ducts and Fans

§150(m): Duct and Fans

☐ 1. All air-distribution system ducts and plenums installed, sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used; and

☐ 1. Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

☐ 2D. Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

☐ 7. Exhaust fan systems have back draft or automatic dampers.

☐ 8. Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

☐ 9. Protection of Insulation. Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

☐ 10. Flexible ducts cannot have porous inner cores.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.**

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

INSTALLATION CERTIFICATE		CF-6R-MECH-05
Indoor Air Quality and Mechanical Ventilation		**(Page 1 of 5)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Ventilation for Indoor Air Quality (IAQ): All dwelling units shall meet the requirements of ANSI/ASHRAE standard 62.2. Ref: Title 24 Part 6 Section 150(o). Equation and table numbering on this CF-6R corresponds to the numbering for that information in the published ASHRAE Standard 62.2.

WHOLE-BUILDING VENTILATION

Ventilation Rate: A mechanical supply system, exhaust system, or combination thereof shall provide whole-building ventilation with outdoor air each hour at no less than the rate in equation 4.1a. For dwelling occupant densities known to be greater than (N_{br} + 1), the rate shall be increased by 7.5 cfm for each additional person.

(Eq. 4.1a) $Q_{fan} = 0.01A_{floor} + 7.5(N_{br} + 1)$

Where:
A_{floor} = conditioned floor area, ft^2
N_{br} = number of bedrooms; not to be less than one
Q_{fan} = ventilation air requirement = fan flow rate, (cfm)

Enter Eq 4.1a Calculation:
A_{floor} =
N_{br} =
Q_{fan} =

Delivered Ventilation: The effective ventilation rate of an **intermittent** system is the combination of its delivered capacity, its fractional on-time, cycle time, and the ventilation effectiveness from Table 4.2. This calculation only applies to intermittent systems.

(Eq. 4.2) $Q_f = Q_r / (\varepsilon f)$

Where:
Q_r = ventilation air requirement from Eq. 4.1a (above)
f = daily fractional on-time, (%)
ε = ventilation effectiveness (from Table 4.2)
Q_f = fan flow rate during the on-cycle (cfm)

Enter Eq 4.2 Calculation (if applicable).
Q_r =
f =
ε =
Q_f =

Table 4.2 – Ventilation Effectiveness for Intermittent Fans

Daily Fractional On-Time, f	Ventilation effectiveness, ε
$f \leq 35\%$	0.33
$35\% \leq f < 60\%$	0.50
$60\% \leq f < 80\%$	0.75
$80\% \leq f$	1.0
Fan runs at least once every three hours	1.0

Whole-Building Ventilation Rate Summary

Select the method used to provide Whole-Building Ventilation and enter the required fan flow rate (cfm). Select one:

☐ Continuous fan flow (cfm) = _____

☐ Intermittent fan flow (cfm) = _____

Use the fan flow rate from this summary for selection of the whole-building ventilation fan and for the duct design for the whole-building ventilation system. Provide the system design information in applicable sections below.

LOCAL VENTILATION EXHAUST

Local mechanical exhaust fans shall be installed in each kitchen and bathroom. The minimum airflow rates shall be at least the amount indicated in tables 5.1 and 5.2.

Table 5.1
Intermittent Local Ventilation Exhaust Airflow Rates

Application	Airflow	Notes
Kitchen	100 cfm	Vented range hood required if exhaust fan flow is less than 5 ACH
Bathroom	50 cfm	

Table 5.2
Continuous Local Ventilation Exhaust Airflow Rates

Application	Airflow	Notes
Kitchen	5 ACH	Based on Kitchen Volume
Bathroom	20 cfm	

VENTILATION SYSTEM DESIGN – Fan selection and duct design criteria for compliance

The airflow rates required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measuring device. Alternatively, the airflow rating at a pressure of 0.25 in. w.c. of a certified fan may be used to demonstrate compliance without testing of the airflow of the installed system, provided the system duct sizing meets the prescriptive requirements of Table 7.1, or manufacturer's design criteria. Other methods may be used to provide the required ventilation rates when approved by a licensed design professional, subject to confirmation of delivered ventilation airflow of the installed system. Central Fan Integrated (CFI) ventilation systems shall demonstrate compliance by field testing of the delivered ventilation airflow of the installed system.

WHOLE-BUILDING VENTILATION SYSTEM DESIGN - Identify the ventilation system design criteria		
(select one criteria from this column)	**Requirements for installer to demonstrate compliance with code**	**Airflow Test Required?**
☐ Prescriptive design (Table 7.1)	Enter the installed ventilation air-moving equipment information and the installed ventilation duct system information in the tables below, and certify on the CF-6R that the installed system conforms to the Table 7.1 prescriptive design criteria.	no
☐ Central Fan Integrated (CFI)	Central forced air system fans used in Central Fan Integrated ventilation systems shall demonstrate, in air distribution mode, a watt draw less than 0.58 W/CFM per Standards §151(f)11. Submit a CF-6R-MECH-22-HERS form for each forced air unit used for a CFI system. HERS verification is required.	yes
☐ Engineered Design	Enter the installed ventilation air-moving equipment information and the installed ventilation duct system information in the tables below, and certify on the CF-6R that the installed system conforms to the engineered ventilation system design approved by the enforcement agency.	yes
☐ Manufacturer's design criteria	Enter the installed ventilation air-moving equipment information and the installed ventilation duct system information in the tables below, and certify on the CF-6R that the installed system conforms to the manufacturer's ventilation system duct design criteria.	no

LOCAL VENTILATION SYSTEM DESIGN - Identify the ventilation system design criteria		
(select one criteria from this column)	**Requirements for installer to demonstrate compliance with code**	**Airflow Test Required?**
☐ Prescriptive design (Table 7.1)	Enter the installed ventilation air-moving equipment information and the installed ventilation duct system information in the tables below, and certify on the CF-6R that the installed system conforms to the Table 7.1 prescriptive design criteria.	no
☐ Engineered Design	Enter the installed ventilation air-moving equipment information and the installed ventilation duct system information in the tables below, and certify on the CF-6R that the installed system conforms to the engineered ventilation system design approved by the enforcement agency.	yes
☐ Manufacturer's design criteria	Enter the installed ventilation air-moving equipment information and the installed ventilation duct system information in the tables below, and certify on the CF-6R that the installed system conforms to the manufacturer's ventilation system duct design criteria.	no

Table 7.1 Prescriptive Duct Sizing Requirements

Diameter, (in)	Flex Duct				Smooth Duct			
Fan Rating cfm @ 0.25 in. w.g.	50	80	100	125	50	80	100	125
	Maximum Allowable Duct Length (ft)							
Diameter, (in)	Flex Duct				Smooth Duct			
3	X	X	X	X	5	X	X	X
4	70	3	X	X	105	35	5	X
5	NL	70	35	20	NL	135	85	55
6	NL	NL	125	95	NL	NL	NL	145
7 and above	NL	NL	NL	NL	NL	NL	NL	NL

This table assumes no elbows. Deduct 15 ft of allowable duct length for each turn, elbow, or fitting. Interpolation and extrapolation in Table 7.1 is not allowed. For airflow values not listed, use the next higher value. This table is not applicable for airflow > 125 cfm.
NL = no limit on duct length of this size.
X = not allowed, any length of duct of this size with assumed turns, elbows, fittings will exceed the rated pressure drop.

INSTALLED VENTILATION AIR-MOVING EQUIPMENT INFORMATION

Ventilation devices and equipment shall be tested and rated by HVI procedures for airflow and sound. Sound rating maximum is 1.0 sone for all continuous duty fans; 1.0 sone for intermittent duty whole-building fans; and 3.0 sone for intermittent duty local exhaust fans. Refer to the Residential Compliance Manual section 4.6 for information about exclusions to these sound rating requirements. In the table below, list the fan equipment installed that meets the requirement for whole-building ventilation and local ventilation exhaust.

Fan or System Name or Location[1]	System Type[2] (WBV or LVE)	Required Airflow[3] (CFM)	Fan Manufacturer Name[4]	Fan Model Number[5]	Certified Airflow[6] (CFM)	Sound Rating[7] (Sone)	Fan Watts[8]	Fan Power Ratio (Watt per CFM)[9]

1) Enter the Fan or System Identification Name or Location Name or System Identifier (e.g. "Bath02" "MastBath", "Kitchen01").
2) What type of ventilation requirement is the fan specified to meet? WBV (whole-building ventilation) or LVE (local ventilation exhaust).
3) Enter the required ventilation airflow values determined by the calculations or tables in the WHOLE-BUILDING VENTILATION and/or LOCAL VENTILATION EXHAUST sections at the beginning of this Installation Certificate (CFM). At least one fan must be designated for use for compliance with the "Whole-Building Ventilation" requirement.
4) Enter the fan manufacture's name.
5) Enter the fan model number or series number.
6) Enter the fan's Certified Airflow rating at 0.25 inch w.c. (CFM). Fans rated at less than 0.25 inch w.c. (e.g. 0.1inch w.c.) cannot be used to comply with the ventilation requirements using the prescriptive design criteria in Table 7.1. This certified airflow rating value must be equal to or greater than the required airflow from column 3 of this table when demonstrating compliance using Table 7.1.
7) Enter the fan's certified sound rating (Sone)
8) Enter the fan watt draw
9) Divide the Watt value from column 8 by the Certified Airflow value (CFM) from column 6. For dwellings utilizing the performance energy compliance method, for standalone whole-building ventilation systems (does not apply to local ventilation exhaust fans), the fan power ratio must be less than or equal to the fan power ratio value reported on the Performance CF-1R.

INSTALLED VENTILATION DUCT SYSTEM INFORMATION

Airflows required by the standard refer to delivered airflow of the installed system as determined by testing with a flow hood, flow grid, or other measuring device. Alternatively, the installed equipment's HVI airflow rating at a pressure of 0.25 inch w.c. may be used, provided the system can be inspected to confirm the duct sizing meets the prescriptive requirements of Table 7.1, or manufacturer's duct design criteria.

Fan or System Name or Location[1]	Compliance Method[2] (T; P; or M)	Required Airflow[3] (CFM)	Airflow Test[4] (CFM)	Duct Type[5]	Number of Elbows and Fittings[6]	Actual Duct Length[7] (ft)	Allowable Duct Length[8] (ft)	Pass or Fail[9]

1. *Enter the Fan or System Identification Name, or Location Name, or System Identifier. These should be the same identifiers as shown in the INSTALLED VENTILATION AIR-MOVING EQUIPMENT INFORMATION table column 1 above.*
2. *Enter the method for demonstrating compliance with the ventilation airflow requirements. Enter "T" for Tested ;"P" for Prescriptive Table 7.1 design criteria (inspection); "M" for Manufacturer's duct design criteria (inspection). Note: the building official may require submittal of manufacturer's published design criteria documentation if compliance is to be demonstrated by inspection of the installation for conformance to manufacturer's design criteria.*
3. *Enter the required ventilation airflow values determined by the calculations or tables in the WHOLE-BUILDING VENTILATION and/or LOCAL VENTILATION EXHAUST sections at the beginning of this Installation Certificate (CFM). These should be the same airflow values that were entered for each corresponding fan in column 3 of the INSTALLED VENTILATION AIR-MOVING EQUIPMENT INFORMATION table above.*
4. *If complying by a method that requires an Airflow Test of the installed system, enter the result from the Airflow Test for the installed system (CFM).*
5. *Enter duct type for the installed system. Choices are "Flex" or "Smooth" if using Table 7.1 for compliance.*
6. *Enter total number of elbows or fittings or abrupt turns in the ventilation duct for the installed system.*
7. *Enter the installed system's actual total duct length (ft).*
8. *If complying by use of the prescriptive design criteria or manufacturer's design criteria, enter the Maximum Allowable Duct Length (ft) for the system as determined by Table 7.1 or manufacturer's duct design criteria.*
9. *If complying by airflow test, the system passes if the Tested Airflow[4] equals or exceeds the Required Airflow[3]. If complying by demonstrating conformance to prescriptive design criteria or manufacturer's design criteria, the system passes if actual total duct length from column 7 is less than the maximum allowed length from column 8. Enter: Pass or Fail*

INSTALLATION CERTIFICATE		CF-6R-MECH-05
Indoor Air Quality and Mechanical Ventilation		**(Page 5 of 5)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

OTHER REQUIREMENTS

The items listed below (6.1 through 6.8) correspond to the information given in ASHRAE 62.2 Section 6 "Other Requirements". Refer also to Chapter 4.6 of the Residential Compliance Manual (Section 4.6.5) for information describing these "Other Requirements". The signature of the Responsible Person in the declaration statement below certifies that the building complies with these requirements specified in ASHRAE 62.2 Section 6.1 through 6.8 if applicable.

☐ 6.1 Transfer Air

☐ 6.2 Instructions and Labeling

☐ 6.3 Cloths Dryers

☐ 6.4 Combustion and solid-fuel burning appliances

☐ 6.5 Garages

☐ 6.6 Ventilation Opening Area

☐ 6.7 Minimum filtration

☐ 6.8 Air Inlets

☐ Prescriptive Designs: For ventilation systems that utilize *prescriptive design* criteria, the signature of the Responsible Person in the declaration statement below certifies that the installed system conforms to the prescriptive ventilation system design criteria from Table 7.1 of Standard 62.2 and manufacturer's installation specifications.

☐ Engineered Designs: For ventilation systems that utilize *engineered design* criteria, the signature of the Responsible Person in the declaration statement below certifies that the installed system conforms to the engineered ventilation system design documentation approved by the enforcement agency.

☐ Manufacturer's design criteria: For ventilation systems that utilize *manufacturer's design criteria*, the signature of the Responsible Person in the declaration statement below certifies that the installed system conforms to the manufacturer's published duct system design criteria and installation specifications.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.**

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

INSTALLATION CERTIFICATE		CF-6R-MECH-06
Evaporatively Cooled Condensing Units		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

HVAC SYSTEMS: *Evaporatively Cooled Condensing Units*

CEC Certified Mfr. Name and Model Number	# of Identical Systems	EER_a	EER_b	Duct Location (attic, etc.)	Duct R-value	Cooling Load (Btu/hr)	Cooling Capacity (Btu/hr)

EER_a = EER at 75° F wetbulb and 95° F dry bulb;

EER_b = EER at 65° F wetbulb and 82° F dry bulb

The system complies with all eligibility criteria:		YES	NO
1	EER at 95° F dry bulb and 75° F wet bulb temperature is listed with ARI	☐	☐
2	EER at 82° F dry bulb and 65° F wet bulb temperature is submitted to ARI and published in accordance with ARI guidelines.	☐	☐
	Pass if: Yes in lines 1-5	☐	☐

The system complies with all eligibility criteria:		YES	NO
1	Water stays in the water casing.	☐	☐
2	Water pump starts running when the system is turned on.	☐	☐
3	When the water pump is running, verify that all the condenser coils are wet.	☐	☐
4	High pressure trip for the compressor is set (per manufacturer's documents) at or below 300 psig for R22 Refrigerant and at or below the saturation pressure corresponding to a temperature of 131°F for all other refrigerants.	☐	☐
5	When the water supply to the water casing is turned off and the casing is drained, the water pump (if the pump is water cooled) and the compressor trip off.	☐	☐
6	Condenser coils have a corrosion-resistant coating.	☐	☐
7	Electrolytic protection is installed, and the wiring of the protection circuit is intact.	☐	☐
8	Water casing is made up of corrosion-resistant material.	☐	☐
9	A blow-down pump is installed for periodic blow-down in order to remove solids from the water casing. Operation of this pump is automatic and is linked to compressor run time or conductivity of the water in the casing.	☐	☐
10	Water casing is sloped downward toward the blow-down pump location.	☐	☐
11	Drift elimination is in place, there is not a mist of water exiting with the exhaust air.	☐	☐
12	Verify that condensate from the cooling coils is routed to water casing unless a document is submitted to the Building Department showing that doing so is not practical due to availability of space, health, or safety concerns.	☐	☐

13	Condenser has manufacturer's certification that water consumption is less than or equal to 5.0 gallons per ton-hour of capacity at ARI Rating conditions.	☐	☐
14	Water connection is made with tubing not more than ¼" ID at the unit. Larger line may come up to the connection.	☐	☐
15	Overflow from the unit is not connected directly to the sewer drain (so that in the event of a water float failure, an overflow condition can be more easily detected) or another means of determining an overflow condition is provided.	☐	☐
	Pass if: Yes in lines 1-15	☐	☐

☐ EER for evaporatively cooled condensers must be verified by a HERS rater.
☐ Ducts are required to be tested and sealed in all evaporatively cooled condenser installations, and the duct sealing must be verified by a HERS rater.
☐ Proper refrigerant charge or a Charge Indicator Light (certified by the Energy Commission) must be verified by a HERS rater for all evaporatively cooled condenser installations.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.**

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

INSTALLATION CERTIFICATE		CF-6R-MECH-07
Evaporative Coolers		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Evaporative Cooler Units

CEC Certified Mfr. Name and Model Number	# of Identical Systems	EER	Duct Location (attic, etc.)	Duct R-value	Total Power (watts)
		13			
		13			
		13			
		13			

The system complies with all eligibility criteria:		☐ System Qualifies	
		✓	✓
1	The equipment manufacturer shall certify to the Commission that water use does not exceed 7.5 gallons per ton hour based on the Title 20 Appliance Standards testing criteria.	☐ Yes	☐ No
2	Equipment shall be permanently installed (no window or portable units).	☐ Yes	☐ No
3	Installation shall provide for automatic relief of supply air from the house with maximum air velocity through the relief dampers not exceeding 800 fpm (at the Title 20 rated airflow). Pressure relief dampers and ductwork shall be distributed to provide adequate airflow through all habitable rooms. For installations with an attic, ceiling dampers shall be installed to relieve air into the attic, and then to outside through attic vents. For installations without an attic, sidewall relief dampers are acceptable.	☐ Yes	☐ No
4	To minimize water consumption, bleed systems are not allowed.	☐ Yes	☐ No
5	A water quality management system (either "pump down" or conductivity sensor) is required. "Pump down" systems can either be integral to the evaporative cooler or they can be accessories that operate on a timed interval. The time interval between dumps shall be set to a minimum of six hours of cooler operation. Longer intervals are encouraged if local water quality allows	☐ Yes	☐ No
6	Automatic thermostats are required. On/off control is not allowed.	☐ Yes	☐ No
7	If the evaporative cooler duct system is shared with a heating and/or cooling system, the installed duct system shall employ backdraft dampers at the evaporative cooler supply.	☐ Yes	☐ No
8	The installing contractor must provide a winter closure device that substantially blocks outdoor air from entering the indoor space.	☐ Yes	☐ No
9	The size of the water inlet connection at the evaporative cooler shall not exceed 3/8".	☐ Yes	☐ No
10	Unless prohibited by local code, the sump overflow line shall not be directly connected to a drain and shall be terminated in a location that is normally visible to the building occupants.	☐ Yes	☐ No

INSTALLATION CERTIFICATE		CF-6R-MECH-07
Evaporative Coolers		**(Page 2 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

11	System type is either indirect or direct/indirect Note: direct evaporative coolers cannot be used as part of the evaporative cooling compliance option. (Circle witch type)	indirect	direct/ indirect
	Pass if: Yes in lines 1-	☐ Pass	☐ Fail

DECLARATION STATEMENT

- **I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.**
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.**

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

INSTALLATION CERTIFICATE		CF-6R-MECH-20-HERS
Duct Leakage Test – Completely New or Replacement Duct System		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Enter the Duct System Name or Identification/Tag:
Enter the Duct System Location or Area Served:
Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.

This certificate is required for compliance for completely new duct systems installed in new dwelling construction, and also for completely new or replacement duct systems in existing dwellings. For existing dwellings, a completely new or replacement duct system can also include existing parts of the original duct system (e.g., register boots, air handler, coil, plenums, etc.) if those parts are accessible and they can be sealed.

Duct Leakage Diagnostic Test – completely new or replacement duct system

Enter a value for the Allowed Leakage (CFM) for the duct system leakage verification. The value entered must be the Verified Low Leakage Ducts in Conditioned Space criteria or one of the three calculated leakage rates described below.	
Verified Low Leakage Ducts in Conditioned Space (VLLDCS) Compliance Credit. If compliance credit for verified low leakage ducts in conditioned space is shown in the special features section of the CF-1R, the leakage to outside test method must be used to verify duct leakage (refer to RA3.1.4.3.4), and 25 CFM must be entered for Allowed Leakage.	Allowed Leakage (CFM)
Allowed leakage calculation – (select one calculation method from this section). Use 6% (*leakage factor* = 0.06) for calculations if tested at "final" or 4% (*leakage factor* = 0.04) if tested at "rough." When utilizing Low Leakage Air Handler (LLAH) credit, the allowed duct leakage may be specified by the CF-1R to be less than 6%, in which case the user-specified leakage rate must be used in the calculations below. For example, if the user-specified leakage (specified as a percentage of fan airflow) is reported on the CF-1R as 3%, then use a *leakage factor* of 0.03 in the calculations below. ☐ Cooling system method: Nominal capacity of condenser in Tons _____ x 400 x *leakage factor* =_____(CFM) ☐ Heating system method: 21.7 x _____ Output Capacity in Thousands of Btu/hr x *leakage factor* =_____(CFM) ☐ Measured airflow method (RA3.3): Enter measured fan flow in CFM here_____ x *leakage factor* =_____(CFM)	
Enter value for **Actual** leakage (CFM) in the right column, from measurement using applicable duct leakage pressurization test procedure from Reference Residential Appendix RA3.1(CFM @ 25 Pa).	Actual Leakage (CFM)
List **Actual** Leakage from duct leakage test (CFM)	
Pass if Actual Leakage is less than Allowed Leakage	☐ **Pass** ☐ **Fail**
For complete replacement of duct systems only, if the 6 percent leakage rate criteria cannot be met, a smoke test should be performed to verify that the excess leakage is coming only from a pre-existing furnace cabinet (air handler cabinet), and not from other *accessible* portions of the duct system. A HERS rater must verify the installation (No sampling allowed). List **Actual** Leakage from smoke test(CFM)	
Pass if all accessible leaks (except for existing air handler) are sealed using smoke	☐ **Pass** ☐ **Fail**

INSTALLATION CERTIFICATE		CF-6R-MECH-20-HERS
Duct Leakage Test – Completely New or Replacement Duct System		**(Page 2 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Compliance Method

This dwelling was: (select one of the following two choices):

☐ Tested at Final

☐ Tested at Rough-in (requires installer to complete the *visual inspection at final construction stage* described below)

Visual Inspection at Final Construction Stage (if applicable)

After installing the interior finishing wall and verifying that the above rough-in tests was completed, the following procedure must be performed:

☐ For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.

☐ If the house rough-in duct leakage test was conducted without an air handler installed, inspect the connection points between the air handler and the supply and return plenums to verify that the connection points are properly sealed.

☐ Inspect all joints to ensure that no cloth backed rubber adhesive duct tape is used.

☐ Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured to the closed position during duct leakage testing.

☐ All supply and return register boots must be sealed to the drywall

☐ New duct installations cannot utilize building cavities as plenums or platform returns in lieu of ducts.

☐ Mastic and draw bands must be used in combination with Cloth backed, rubber adhesive duct tape to seal leaks at duct connections.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.** I will ensure that all Installation Certificates will come from a HERS provider data registry for multiple orientation alternatives, and beginning October 1, 2010, for all low-rise residential buildings.

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):
Is this installation monitored by a Third Party Quality Control Program (TPQCP)? Yes No		Name of TPQCP (if applicable):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

INSTALLATION CERTIFICATE		CF-6R-MECH-21-HERS
Duct Leakage Test – Existing Duct System		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Enter the Duct System Name or Identification/Tag:

Enter the Duct System Location or Area Served:

Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.

This installation certificate is required for compliance for alterations and additions in existing dwellings to space conditioning systems and duct systems.

Note: For existing dwellings, a completely new or replacement duct system can also include existing parts of the original duct system (e.g., register boots, air handler, coil, plenums, etc.) if those parts are accessible and they can be sealed. For a completely new or replacement duct system installed in an existing dwelling, use the Installation Certificate titled "Duct Leakage Test – Completely New or Replacement Duct System."

Duct Leakage Diagnostic Test – Existing Duct System

Select one compliance method from the following four choices.

☐ Option 1. Measured leakage less than 15% of Fan Airflow.

☐ Option 2. Measured leakage to outside less than 10% of Fan Airflow.

☐ Option 3. Reduce leakage by 60% or more, and conduct smoke test to seal all accessible leaks.

☐ Option 4. Fix all accessible leaks using smoke test, and HERS rater must verify.

Note: (One of Options 1, 2 or 3 must be attempted before utilizing Option 4.)

Determine nominal **Fan Airflow** using one of the following three calculation methods.

☐ Cooling system method: Size of condenser in Tons _____ x 400 =_____CFM

☐ Heating system method: 21.7 x _____ Heating Output Capacity (kBtuh) =_____CFM

☐ Measured system airflow using RA3.3 airflow test procedures: _____CFM

1	**Option 1** used then: Allowed leakage = Fan Airflow _____ x 0.15 = _____CFM Actual leakage = _____CFM **Pass if Actual leakage is less than Allowed leakage**	☐ Pass ☐ Fail
2	**Option 2** used then: Allowed leakage = Fan Airflow _____ x 0.10 = _____CFM Actual leakage to outside = _____CFM **Pass if Actual leakage to outside is less than Allowed leakage**	☐ Pass ☐ Fail
3	**Option 3** used then: Initial leakage prior to start of work= _____CFM Final leakage after sealing all accessible leaks using smoke test = _____CFM Initial leakage _____ - Final leakage _____ = Leakage reduction_____CFM (Leakage reduction _____ / Initial leakage _____) x 100% = % Reduction **Pass if % Reduction ≥ 60%**	☐ Pass ☐ Fail
4	**Option 4** used then: All accessible leaks repaired using smoke test. HERS rater must verify (No sampling). **Pass if all accessible leaks have been sealed using Smoke Test**	☐ Pass ☐ Fail

☐ Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured to the closed position during duct leakage testing.

☐ All supply and return register boots must be sealed to the drywall if smoke test is utilized for compliance – applies to duct leakage compliance option 3 (leakage reduction by 60%) and option 4 (fix all accessible leaks) described above.

☐ New duct installations cannot utilize building cavities as plenums or platform returns in lieu of ducts.

☐ Mastic and draw bands must be used in combination with cloth backed rubber adhesive duct tape to seal leaks at all new duct connections.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
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Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):
Is this installation monitored by a Third Party Quality Control Program (TPQCP)? ☐ Yes ☐ No		Name of TPQCP (if applicable):

INSTALLATION CERTIFICATE		CF-6R-MECH-22-HERS
HSPP/PSPP Installation; Cooling Coil Airflow & Fan Watt Draw Test		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

Hole for the placement of a Static Pressure Probe (HSPP), and Permanently installed Static Pressure Probe (PSPP) in the supply plenum

When the Certificate of Compliance (CF1R)indicates Cooling Coil Airflow or Fan Watt Draw verification are required, HSPP or PSPP are required to be installed in each air handler in the dwelling. Procedures for installing HSPP and PSPP are described in Reference Residential Appendix RA3.3. This measure requires verification by a HERS rater.

Select one method from the two choices below for compliance with the HSPP/PSPP requirement for this dwelling.		
☐	HSPP	1/4 inch (6 mm) hole labeled and located downstream of the evaporator coil in the supply plenum as shown in the figure in Section RA3.3.1.1.
☐	PSPP	1/4 inch (6 mm) hole equipped with a permanently installed pressure probe, labeled and located downstream of the evaporator coil in the supply plenum as shown in the figure in Section RA3.3.1.1.

System Name or Identification/Tag				
System Location or Area Served				
Confirm that a HSPP or PSPP has been installed on the air handler per the requirements of RA3.3.1.1. **Enter Pass or Fail**				

Cooling Coil Airflow Verification

When the Certificate of Compliance indicates Cooling Coil Airflow verification is required, the procedures for measuring the cooling coil airflow must be performed as specified in Reference Residential Appendix RA3.3. Results of the cooling coil airflow diagnostic test must be entered in the table below. This measure requires verification by a HERS rater.

Select one method from the three choices below for compliance with the Cooling Coil Airflow test requirement for this dwelling.	
☐	Diagnostic Fan Flow Using Plenum Pressure Matching according to the procedures in RA3.3.3.1.1
☐	Diagnostic Fan Flow Using Flow Grid Measurement according to the procedures in RA3.3.3.1.2
☐	Diagnostic Fan Flow Using Flow Capture Hood according to the procedures in RA3.3.3.1.3

System Name or Identification/Tag				
System Location or Area Served				
Nominal Cooling Capacity (ton) of the outdoor unit.				
Enter the minimum airflow requirement from the CF-1R (CFM/ton).				
Calculate the target minimum airflow for the test by multiplying the CFM/ton criteria specified on the CF-1R by the nominal cooling capacity of the outdoor unit (ton). **Target (CFM)**				
Enter the diagnostically tested airflow (CFM). **Tested (CFM)**				
The system complies if Tested (CFM) is equal or greater than Target (CFM). **Enter Pass or Fail**				

Fan Watt Draw Verification

When the Certificate of Compliance indicates Fan Watt Draw verification is required, the procedures for measuring the Fan Watt Draw must be performed as specified in Reference Residential Appendix RA3.3. Results of the Fan Watt Draw diagnostic test must be entered in the table below. This measure requires verification by a HERS rater. Note: Fan watt draw must be measured simultaneously with cooling coil airflow. The fan watt draw measurement and cooling coil airflow measurement must simultaneously meet or exceed their target criteria specified by the CF-1R for the dwelling.

Select one method from the two choices below for compliance with the Fan Watt Draw test requirement for this dwelling.

☐ Portable Watt Meter Measurement according to the procedures in RA3.3.3.3.1

☐ Utility Revenue Meter Measurement according to the procedures in RA3.3.3.3.2

System Name or Identification/Tag				
System Location or Area Served				
Enter the air handler Tested (CFM) from the cooling coil airflow test table above.				
Enter the fan watt draw requirement from the CF-1R (Watt/CFM).				
Calculate the target maximum Watt draw for the test by multiplying the Watt/CFM criteria specified on the CF-1R by the air handler Tested (CFM). **Target (Watt)**				
Enter the diagnostically tested Watt draw (Watt). **Tested (Watt)**				
The system complies if Tested (Watt) is less than or equal to Target (Watt) **Enter pass or Fail**				

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
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Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):
Is this installation monitored by a Third Party Quality Control Program (TPQCP)? ☐Yes ☐No		Name of TPQCP (if applicable):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

INSTALLATION CERTIFICATE		CF-6R-MECH-23-HERS
Verification of High EER Equipment		**(Page 1 of 1)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Verification of High EER Equipment

Procedures for verification of High EER Equipment are described in Reference Residential Appendix RA3.4. For dwelling units with multiple systems, the procedures must be applied to each system separately. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

1	System Name or Identification/Tag				
2	System Location or Area Served				
3	Certified EER Rating of the installed equipment (Btu/Watt-hr)				
4	Make and Model Number of the installed Outdoor Unit				
5	Make and Model Number of the installed Inside Coil				
6	Make and Model Number of the installed Furnace or Air Handler.				
7	Minimum Equipment EER required for compliance as reported on the CF-1R				
☐ When a high EER system specification includes a time delay relay, the installation of the time delay relay must be verified for compliance credit. Refer to Reference Residential Appendix RA3.4.3 for the Time Delay Relay Verification Procedure. ☐ When installation of specific matched equipment is necessary to achieve a high EER, installation of the specific equipment must be verified for compliance credit. Refer to Reference Residential Appendix RA3.4.3 for the Matched Equipment Verification Procedure.					
8	If the Certified EER Rating in row 3 is equal to or greater than the required minimum EER in row 7, the unit complies. **If the unit complies enter Pass**				

DECLARATION STATEMENT

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- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
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Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

INSTALLATION CERTIFICATE		CF-6R-MECH-24-HERS
Charge Indicator Display (CID)		**(Page 1 of 1)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

CHARGE INDICATOR DISPLAY (CID)

Charge Indicator Display (CID) specifications are available in Reference Joint Appendix JA6; HERS verification procedure for the CID is in Reference Residential Appendix RA3.4.2. If refrigerant charge verification is required for compliance, and a CID has been installed on the system, a pass for this CID verification for an installed system is sufficient for demonstrating compliance with the refrigerant charge verification requirement for that system, thus submittal of a standard refrigerant charge verification compliance form (MECH 25) is not required for a system that has a passing CID verification shown in the table below.

CID - Verification of the Presence and Proper Function of a Charge Indicator Display

System Name or Identification/Tag						
System Location or Area Served						
CID Manufacturer Name and Model Number						
1	☐Yes	☐No	The display module is mounted adjacent to the system thermostat			
2	☐Yes	☐No	The manufacturer has certified to the Energy Commission that the CID model meets the requirements of Reference Joint Appendix JA6			
3	☐Yes	☐No	The CID was installed by the manufacturer			
4	☐Yes	☐No	or if 3 is No, the CID was installed according to the manufacturer's specifications			
Yes to 1 and 2 and yes to either 3 or 4 is a pass			enter Pass or Fail		✓ ☐ Pass	✓ ☐ Fail

DECLARATION STATEMENT

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- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
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Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):
Is this installation monitored by a Third Party Quality Control Program (TPQCP)? ☐Yes ☐No		Name of TPQCP (if applicable):

Registration Number: *Registration Date/Time:* *HERS Provider:*

INSTALLATION CERTIFICATE		CF-6R-MECH-25-HERS
Refrigerant Charge Verification - Standard Measurement Procedure		**(Page 1 of 5)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Note: If installation of a Charge Indicator Display (CID) is utilized as an alternative to refrigerant charge verification for compliance, a MECH-24 Certificate (instead of this MECH-25 Certificate) should be used to demonstrate compliance with the refrigerant charge verification requirement. TMAH and STMS are not required for compliance, when a CID is utilized for compliance.

As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

Temperature Measurement Access Holes (TMAH) and Saturation Temperature Measurement Sensors (STMS)
Procedures for installing TMAH are specified in Reference Residential Appendix RA3.2. If refrigerant charge verification is required for compliance, TMAH are also required for compliance. STMS are only required for completely new or replacement space-conditioning systems that utilize prescriptive compliance method.

TMAH - Access Holes in Supply and Return Plenums of Air Handler

System Name or Identification/Tag					
System Location or Area Served					
1	☐Yes	☐No	5/16 inch (8 mm) access hole upstream of evaporative coil in the return plenum and labeled according to Figure in Section RA3.2.2.2.2.		
2	☐Yes	☐No	5/16 inch (8 mm) access hole downstream of evaporative coil in the supply plenum and labeled according to Figure in Section RA3.2.2.2.2.		
Yes to 1 and 2 is a pass.			Enter Pass or Fail	✓ ☐ Pass	✓ ☐ Fail

STMS - Sensor on the Evaporator Coil

System Name or Identification/Tag						
3	☐Yes	☐No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.			
4	☐Yes	☐No	The sensor wire is terminated with a standard mini plug suitable for connection to a digital thermometer. The sensor mini plug is accessible to the installing technician and the HERS rater without changing the airflow through the condenser coil			
5	☐Yes	☐No	The sensor measures the saturation temperature of the coil within 1.3 degrees F			
Yes to 3, 4, and 5 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	✓ ☐ N/A	✓ ☐ Pass	✓ ☐ Fail

STMS - Sensor on the Condenser Coil

System Name or Identification/Tag						
6	☐Yes	☐No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.			
7	☐Yes	☐No	The sensor wire is terminated with a standard mini plug suitable for connection to a digital thermometer. The sensor mini plug is accessible to the installing technician and the HERS rater without changing the airflow through the condenser coil			
8	☐Yes	☐No	The sensor measures the saturation temperature of the coil within 1.3 degrees F			
Yes to 6, 7, and 8 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	✓ ☐ N/A	✓ ☐ Pass	✓ ☐ Fail

Standard Charge Measurement Procedure (for use if outdoor air dry-bulb is above 55 °F)

Procedures for determining Refrigerant Charge using the Standard Charge Measurement Procedure are available in Reference Residential Appendix RA3.2. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

- *The system should be installed and charged in accordance with the manufacturer's specifications before starting this procedure.*
- *The system must meet minimum airflow requirements as prerequisite for a valid refrigerant charge test.*
- *If outdoor air dry-bulb is 55 °F or below, the installer must use the Alternate Charge Measurement Procedure.*

Space Conditioning Systems

System Name or Identification/Tag				
System Location or Area Served				
Outdoor Unit Serial #				
Outdoor Unit Make				
Outdoor Unit Model				
Nominal Cooling Capacity Btu/hr				
Date of Verification				

Calibration of Diagnostic Instruments

Date of Refrigerant Gauge Calibration		(must be re-calibrated monthly)
Date of Thermocouple Calibration		(must be re-calibrated monthly)

Measured Temperatures (°F)

System Name or Identification/Tag				
Supply (evaporator leaving) air dry-bulb temperature ($T_{supply,\ db}$)				
Return (evaporator entering) air dry-bulb temperature ($T_{return,\ db}$)				
Return (evaporator entering) air wet-bulb temperature ($T_{return,\ wb}$)				
Evaporator saturation temperature ($T_{evaporator,\ sat}$)				
Condensor saturation temperature ($T_{condensor,\ sat}$)				
Suction line temperature ($T_{suction}$)				
Liquid Line Temperature (T_{liquid})				
Condenser (entering) air dry-bulb temperature ($T_{condenser,\ db}$)				

Minimum Airflow Requirement

Temperature Split Method Calculations for determining Minimum Airflow Requirement for Refrigerant Charge Verification. The temperature split method is specified in Reference Residential Appendix RA3.2.				
System Name or Identification/Tag				
Calculate: Actual Temperature Split = $T_{return,\ db} - T_{supply,\ db}$				
Target Temperature Split from Table RA3.2-3 using $T_{return,\ wb}$ and $T_{return,\ db}$				
Calculate difference: Actual Temperature Split – Target Temperature Split =				
Passes if difference is between -3°F and +3°F or, upon remeasurement, if between -3°F and -100°F **Enter Pass or Fail**				

Note: Temperature Split Method Calculation is not necessary if actual Cooling Coil Airflow is verified using one of the airflow measurement procedures specified in Reference Residential Appendix RA3.3. If actual cooling coil airflow is measured, the value must be equal to or greater than the Calculated Minimum Airflow Requirement in the table below.

Calculated Minimum Airflow Requirement (CFM) = Nominal Cooling Capacity (ton) X 300 (cfm/ton)				
System Name or Identification/Tag				
Calculated Minimum Airflow Requirement (CFM)				
Measured Airflow using RA3.3 procedures (CFM)				
Passes if measured airflow is greater than or equal to the calculated minimum airflow requirement. **Enter Pass or Fail**				

Superheat Charge Method Calculations for Refrigerant Charge Verification. This procedure is required to be used for fixed orifice metering device systems				
System Name or Identification/Tag				
Calculate: Actual Superheat = $T_{suction} - T_{evaporator,\ sat}$				
Target Superheat from Table RA3.2-2 using $T_{return,\ wb}$ and $T_{condenser,\ db}$				
Calculate difference: Actual Superheat – Target Superheat =				
System passes if difference is between -5°F and +5°F **Enter Pass or Fail**				

Subcooling Charge Method Calculations for Refrigerant Charge Verification. This procedure is required to be used for thermostatic expansion valve (TXV) and electronic expansion valve (EXV) systems.				
System Name or Identification/Tag				
Calculate: Actual Subcooling = $T_{condenser,\ sat} - T_{liquid}$				
Target Subcooling specified by manufacturer				
Calculate difference: Actual Subcooling – Target Subcooling =				
System passes if difference is between -3°F and +3°F **Enter Pass or Fail**				

Metering Device Calculations for Refrigerant Charge Verification. This procedure is required to be used for thermostatic expansion valve (TXV) and electronic expansion valve (EXV) systems.				
System Name or Identification/Tag				
Calculate: Actual Superheat = $T_{suction} - T_{evaporator,\ sat}$				
Enter allowable superheat range from manufacturer's specifications (or use range between 4°F and 25°F if manufacturer's specification is not available)				
System passes if actual superheat is within the allowable superheat range **Enter Pass or Fail**				

INSTALLATION CERTIFICATE		CF-6R-MECH-25-HERS
Refrigerant Charge Verification - Standard Measurement Procedure		**(Page 5 of 5)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Standard Charge Measurement Summary: System shall pass both refrigerant charge criteria, metering device criteria (if applicable), and minimum cooling coil airflow criteria based on measurements taken concurrently during system operation. If corrective actions were taken, all applicable verification criteria must be re-measured and/or recalculated.				
System Name or Identification/Tag				
System meets all refrigerant charge and airflow requirements. **Enter Pass or Fail**				

☐ Residential Appendix RA3.2.2 requires that if the outdoor temperature is between 55°F and 65°F the return air dry bulb temperature shall be maintained above 70°F during the Standard Charge Measurement Procedure. The signature of the Responsible Person in the declaration statement below certifies this requirement has been met for all applicable system verifications reported on this certificate.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.** I will ensure that all Installation Certificates will come from a HERS provider data registry for multiple orientation alternatives, and beginning October 1, 2010, for all low-rise residential buildings.

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):
Is this installation monitored by a Third Party Quality Control Program (TPQCP)? Yes No		Name of TPQCP (if applicable):

INSTALLATION CERTIFICATE		CF-6R-MECH-26-HERS
Refrigerant Charge Verification - Alternate Measurement Procedure		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

Temperature Measurement Access Holes (TMAH) and Saturation Temperature Measurement Sensors (STMS)
Procedures for installing TMAH are specified in Reference Residential Appendix RA3.2. If refrigerant charge verification is required for compliance, TMAH are also required for compliance. STMS are only required for completely new or replacement space-conditioning systems that utilize prescriptive compliance method.

TMAH - Access Holes in Supply and Return Plenums of Air Handler

System Name or Identification/Tag						
System Location or Area Served						
1	☐Yes	☐No	5/16 inch (8 mm) access hole upstream of evaporative coil in the return plenum and labeled according to Figure in Section RA3.2.2.2.2.			
2	☐Yes	☐No	5/16 inch (8 mm) access hole downstream of evaporative coil in the supply plenum and labeled according to Figure in Section RA3.2.2.2.2.			
Yes to 1 and 2 is a pass.			Enter Pass or Fail		✓ ☐ Pass	✓ ☐ Fail

STMS - Sensor on the Evaporator Coil

System Name or Identification/Tag						
3	☐Yes	☐No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.			
4	☐Yes	☐No	The sensor wire is terminated with a standard mini plug suitable for connection to a digital thermometer. The sensor mini plug is accessible to the installing technician and the HERS rater without changing the airflow through the condenser coil			
5	☐Yes	☐No	The sensor measures the saturation temperature of the coil within 1.3 degrees F			
Yes to 3, 4, and 5 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	✓ ☐ N/A	✓ ☐ Pass	✓ ☐ Fail

STMS - Sensor on the Condenser Coil

System Name or Identification/Tag						
6	☐Yes	☐No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.			
7	☐Yes	☐No	The sensor wire is terminated with a standard mini plug suitable for connection to a digital thermometer. The sensor mini plug is accessible to the installing technician and the HERS rater without changing the airflow through the condenser coil			
8	☐Yes	☐No	The sensor measures the saturation temperature of the coil within 1.3 degrees F			
Yes to 6, 7, and 8 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	✓ ☐ N/A	✓ ☐ Pass	✓ ☐ Fail

INSTALLATION CERTIFICATE		CF-6R-MECH-26-HERS
Refrigerant Charge Verification - Alternate Measurement Procedure		**(Page 2 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Alternate Charge Measurement Procedure (for use if outdoor air dry-bulb is below 55 °F)
Procedures for Determining Refrigerant Charge using the Alternate Method are available in Reference Residential Appendix RA3.2. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

- *The alternative charge measurement procedure requires that the system shall be installed and charged in accordance with the manufacturer's specifications for refrigerant charge using the weigh-in charging method.*
- *Installer verification of line lengths and charge adjustment calculation must be documented on CF-6R before starting this procedure.*
- *If outdoor air dry-bulb is 55 °F or above, installer must use the Standard Charge Measure Procedure.*

Weigh-In Charging Method for Refrigerant Charge Verification				
System Name or Identification/Tag				
System Location or Area Served				
Actual liquid line length (ft)				
Manufacturer's Standard liquid line length (ft)				
Calculate: difference in length (ft) = Actual length – Standard length				
Manufacturer's correction factor (ounces per foot)				
Calculate: charge adjustment = correction factor X difference in length				
Alternate Charge Measurement Summary: System refrigerant charge has been adjusted to meet the manufacturer's specifications based on actual line length **Enter Pass or Fail**				

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Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

INSTALLATION CERTIFICATE		CF-6R-MECH-27-HERS
Maximum Rated Total Cooling Capacity		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Maximum Rated Total Cooling Capacity (MRTCC) Compliance Credit

Procedures for calculating the Maximum Rated Total Cooling Capacity (MRTCC) compliance credit and Electrical Input exception are given in Reference Residential Appendix RA1. The value is calculated by the compliance software and given on the Certificate of Compliance (CF-1R). Compliance with this credit requires that the installed space conditioning system must have a cooling capacity rating at ARI conditions that is equal or less than the MRTCC compliance credit value. The system must also meet the HERS verification requirements for duct leakage, and prescriptive cooling coil airflow compliance credits, and if the Electrical Input Exception is utilized, the EER must be verified. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

1	System Name or Identification/Tag				
2	System Location or Area Served				
3a	ARI Rated Total Cooling Capacity of the installed system (Btu/hr)				
3b	Sum of the ARI Rated Total Cooling Capacities of multiple systems installed in the dwelling (Btu/hr), if applicable.				
Note: MRTCC credit may be calculated for the whole dwelling, or for individual cooling systems in the dwelling. If the MRTCC target value from the CF-1R is for the entire dwelling, and there are multiple cooling systems installed in the dwelling. then the sum of ARI Rated Cooling Capacities of the installed cooling systems must be calculated and entered in row 3b.					
4a	MRTCC target value from the CF-1R (Btu/hr) – if for individual systems				
4b	MRTCC target value from the CF-1R (Btu/hr) – if total for entire dwelling				
5	If the applicable row 3 value is less than or equal to the applicable row 4 value, the unit complies. **If the unit complies enter Pass**				

Electrical Input Exception for MRTCC compliance credit

Electrical Input Exception for MRTCC compliance credit allows the installed rated total cooling capacity to exceed the MRTCC target value for compliance credit if the electrical input of the oversized cooling system is less than or equal to the electrical input of a standard cooling system. For buildings with more than one cooling system, the proposed electrical input is the sum of the values for each system.

1	System Name or Identification/Tag				
2	System Location or Area Served				
6	ARI Rated EER of the installed unit (Btu/Watt-hr)				
7a	Calculate Proposed Electrical Input[7]				
7b	Sum of the Proposed Electrical Input values for entire multiple systems installed in the dwelling (Watt), if applicable.				
8a	Calculate Standard Total Electric Input[8] (Watt) – if for individual systems				
8b	Calculate Standard Total Electric Input[8] (Watt) – if total for entire dwelling				
9	If the applicable row 7 value is less than or equal to the applicable row 8 value, the unit complies. **If the unit complies enter Pass**				

INSTALLATION CERTIFICATE		CF-6R-MECH-27-HERS
Maximum Rated Total Cooling Capacity		**(Page 2 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Notes:

7) Proposed Electrical Input (Watt) = ARI Rated Total Cooling Capacity (Btu/hr) / ARI Rated EER (Btu/Watt-hr) if the proposed Air Conditioner is listed in the ARI database with a specified furnace or air handler and that furnace or air handler is to be installed.

Otherwise, if the proposed Air Conditioner is listed in the ARI database without a furnace or air handler, the proposed electrical input is either:

Proposed Electrical Input (Watt) = [(ARI Rated Total Cooling Capacity (Btu/hr) / ARI Rated EER (Btu/Watt-hr)] +[(ARI Rated Total Cooling Capacity (Btu/hr) x .0048 (Watt-hr/Btu)];

or

Proposed Electrical Input (Watt) = [(ARI Rated Total Cooling Capacity (Btu/hr) / ARI Rated EER (Btu/Watt-hr)] – [(ARI Rated Total Cooling Capacity (Btu/hr) x .0122 (Watt-hr/Btu)] + The measured fan power (Watt); where the measured fan power is determined at an airflow equal to or greater than 350 CFM per ton using the procedure described in RA3.3 of the Residential Appendices

8) Standard Total Electric Input (Watt) = MRTCC target from the CF-1R (Btu/hr) / 10 (Btu/Watt-hr)

☐ Systems must meet the Cooling Coil Airflow HERS verification requirement in order to receive credit for MRTCC.
☐ Systems must meet the Duct Sealing HERS verification requirements in order to receive credit for MRTCC.
☐ Systems must meet the HERS verification requirement for EER if the Electrical Input Exception is utilized to comply with the MTRCC compliance credit

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- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
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Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

INSTALLATION CERTIFICATE		CF-6R-MECH-28-HERS
Low Leakage Air Handler Verification		**(Page 1 of 1)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Verified Low Leakage Air Handler (LLAH) with Sealed and Tested Duct System *An additional compliance credit is available for verified low leakage ducts if a Low Leakage Air Handler is installed. The air handler must be connected to a Sealed and Tested New Duct System to receive the credit. Refer to Residential Appendix RA3.1.4.3.10. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.*

System Name or Identification/Tag				
System Location or Area Served				
LLAH Unit Make				
LLAH Unit Model				
☐ The LLAH must be connected to a New Duct System that meets the HERS verification requirement for Sealed and Tested Ducts in order to receive compliance credit. ☐ The LLAH cabinet (furnace or heat pump fan and inside coil) must be certified to the Commission to leak 2 percent or less of its nominal air conditioning cfm delivered when pressurized to 1-inch water gauge with all present air inlets, air outlets, and condensate drain port(s) sealed.				
If the installed LLAH documentation confirms the unit meets the certification requirement and Duct Testing is specified on the CF-1R, the unit complies. **If the unit complies enter Pass**				

DECLARATION STATEMENT

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- I understand that a HERS rater will check the installation to verify compliance, and that that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
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Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

INSTALLATION CERTIFICATE		CF-6R-MECH-29-HERS
Supply Duct Compliance Credits - Location; Surface Area; R-value		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Enter the Duct System Name or Identification/Tag:
Enter the Duct System Location or Area Served:
Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.

SUPPLY DUCT LOCATION COMPLIANCE CREDITS

Credit is available for supply duct systems entirely in conditioned space or with reduced surface area in unconditioned spaces.

☐ **LESS THAN 12 LINEAR FEET OF SUPPLY DUCT OUTSIDE OF CONDITIONED SPACE COMPLIANCE CREDIT.** *A detailed duct design is not required for compliance with this measure. HERS verification is required for compliance with this measure.*

☐Yes	☐No	Less than 12 linear feet of supply duct outside of conditioned space.		
		Yes to this compliance credit is a pass	✓ ☐ **Pass**	✓ ☐ **Fail**

☐ **SUPPLY DUCTS LOCATED IN CONDITIONED SPACE COMPLIANCE CREDIT.** *A detailed duct design is not required for compliance with this measure. HERS verification is required for compliance with this measure.*

☐Yes	☐ No	Ducts are located within the conditioned volume of building.		
		Yes to this compliance credit is a pass	✓ ☐ **Pass**	✓ ☐ **Fail**

SUPPLY DUCT SURFACE AREA REDUCTION AND R-VALUE COMPLIANCE CREDITS

Credit is available for supply duct systems with reduced surface area in unconditioned space with varying combinations of higher performance insulation. In order to claim these credits a detailed duct system design is required to be documented on the plans approved by the enforcement agency, and the installation must be certified to be consistent with the approved plans by the installer, and the installation must be verified by a HERS rater. The size, R-value, and location of each duct segment in an unconditioned space including details describing if ducts are buried in attic insulation must be shown in the design drawings approved by the enforcement agency, entered into the compliance software, and shown on the CF-1R for the building. Procedures for field verification and diagnostic testing for this group of compliance credits are described in Reference Residential Appendix RA3.1

☐ **SUPPLY DUCT SURFACE AREA REDUCTION COMPLIANCE CREDIT**

☐Yes	☐ No	Prescriptive Cooling Coil Airflow compliance has been verified.		
☐Yes	☐ No	The building's duct system design was approved by the enforcement agency, and the duct system design is detailed in the special features section of the CF-1R approved by the enforcement agency.		
☐Yes	☐ No	The installed duct system does not have severely twisted or compressed sections that would restrict required operating airflow.		
☐Yes	☐ No	The installed duct system layout, including duct sizes and locations of supply & return registers match the duct system design plans approved by the enforcement agency, and the installed duct system meets the requirements for Verified Duct Design specified in Reference Residential Appendix RA3.1.4.1.1.1		
		Yes to all is a pass	✓ ☐ **Pass**	✓ ☐ **Fail**

INSTALLATION CERTIFICATE		CF-6R-MECH-29-HERS
Supply Duct Compliance Credits - Location; Surface Area; R-value		**(Page 2 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

☐ BURIED DUCTS ON THE CEILING R-VALUE COMPLIANCE CREDIT

In order to claim credit for buried ducts on the ceiling, the conditions for the Supply Duct Surface Area Reduction (above) must be met, the approved duct design must identify which portions of the duct system are "Buried", and the installed duct system must conform to the approved duct design. Also, the duct system must meet prescriptive Duct Leakage test requirements and the building must meet Quality Insulation Installation requirements.

☐Yes	☐ No	The duct design passes the Supply Duct Surface Area Reduction compliance credit, buried ducts are shown on the approved duct design and on the approved CF-1R, and the installed duct system is consistent with the approved duct design drawings.		
☐Yes	☐ No	Meets Verified Duct Leakage requirements		
☐Yes	☐ No	Meets Verified Quality Insulation Installation requirements		
		Yes to all is a pass	**✓ ☐ Pass**	**✓ ☐ Fail**

☐ DEEPLY BURIED DUCTS R-VALUE COMPLIANCE CREDIT

In order to claim credit for buried ducts on the ceiling, the conditions for the Supply Duct Surface Area Reduction (above) must be met, the approved duct design must identify which portions of the duct system are "Deeply Buried", and the installed duct system must conform to the approved duct design. Also, the duct system must meet prescriptive Duct Leakage test requirements and the building must meet Quality Insulation Installation requirements.

☐Yes	☐ No	The duct design passes the Supply Duct Surface Area Reduction compliance credit, buried ducts are shown on the approved duct design and on the approved CF-1R, and the installed duct system is consistent with the approved duct design drawings.		
☐Yes	☐ No	Meets Verified Duct Leakage requirements		
☐Yes	☐ No	Meets Verified Quality Insulation Installation requirements		
		Yes to all is a pass	**✓ ☐ Pass**	**✓ ☐ Fail**

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Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____